



Elliott Bay Design Group - North Carolina, PLLC
5305 Shilshole Avenue NW, Suite 100 Seattle, WA 98107

MEMORANDUM

Vessel: NCDOT Pedestrian Ferry
Engineer: R Charles Barrett
Refer To: 16109-003-835-1-
Date: March 3, 2017



Subject: Tonnage Plans & Calculations

PURPOSE

Calculate the US Regulatory tonnage based on the contract design of the vessel. The proposed vessel, a 92 ft x 26 ft x 11.5 ft Passenger Catamaran Ferry, will have a US Standard tonnage certificate. The vessel will be operated by the North Carolina Department of Transportation.

PROCEDURE

The Standard, or US, tonnage [1] is calculated in parts per the regulations. The tonnage length is set by ordinary 6 inch deep framing at the bow and 6 inch deep cant frames at the stern. The main tonnage framing forward is transverse with zero stations at the bow and stern, and at Stations 2 and 3. The lowest breadth at each tonnage station is not zero due to the catamaran measurement of breadths. There are watertight bulkheads at frames 20 and 22 there are full height tonnage bulkheads at Frames 16 and 18. At Frames 10 through 17, which are spaced 4 feet apart, the bottom and outboard side shell longitudinal stiffeners will be tightly fitted to the transverse ring frames, and seal welded to the ring frame on both sides. Forward of frame 17, all hull and deck longitudinal stiffeners will be tightly fitted to the transverse ring frames, and seal welded to the ring frame on both sides.

The mold lines for hull shape at the tonnage stations were taken from Reference [2].

The above deck tonnage will be less than one ton. Above the main deck, tonnage exemptions are made using the rules for light and air, companion, pilothouse, and shared water closet spaces. Other spaces are exempted by use of tonnage openings. There will be 3x4 feet tonnage openings port and starboard at Bulkhead 8. These openings will exclude the passenger cabin. The opening to the food services area at frame 8 will exempt that space from tonnage. The bar counter at the food services area will be removable with simple tools leaving an opening much larger two 3x4 feet openings. There should be no plumbing or other hard connections to the forward counter. The remaining spaces are shared water closets, companions, and a galley. The entire wheelhouse space is dedicated to controlling the vessel. The station locations are shown in the Tonnage Sketch below.

CONCLUSIONS

The US tonnage is estimated to be 95.2 gross tons.

REFERENCES

[1] *MTN No. 01-99, Change 9, Standard Measurement System*, Jan 2017.

[2] Elliott Bay Design Group, *Rhino model 16109-3 modified chine.3dm*, Seattle, WA, 1/10/17.

TONNAGE CALCULATIONS

Tonnage length:	87.00	Number of decks:	0.00										
Number of divisions of length:	8.00	Number of Masts:	0										
Common interval:	10.875	Stem:	Plumb										
1/3 common interval:	3.625	Stern:	Plumb										
Tonnage depth:	10.60	Material:	Steel										
Number of divisions of depth:	4	Service:	Passenger										
UNDER TONNAGE DECK VOLUME													
Section Number	Simpson's Multiplier	Section Area Square Feet	Product	TONNAGE									
1	1	0.00	0.00	UNDER TONNAGE DECK: 94.22									
2	4	0.00	0.00	Between Decks: 0.00									
3	2	0.00	0.00	Forecastle: 0.00									
4	4	157.48	629.92	Bridge: 0.00									
5	2	161.14	322.29	Deck Houses: 0.00									
6	4	159.71	638.82	Side Houses: 0.00									
7	2	171.17	342.34	Mast Houses: 0.00									
8	4	166.43	665.71	Trunks: 0.00									
9	1	0.00	0.00	Excess Hatchways: 0.00									
10	0	0.00	0.00	Light and Air: 0.00									
11	0	0.00	0.00	Shelter Deck: 0.00									
12	0	0.00	0.00	Superstructures: 1.00									
13	0	0.00	0.00										
Total:			2599.08										
1/3 common interval:			3.625										
Under Deck Volume:			9421.66										
Ballast Tank Volume:			0.00										
Under Deck Volume w/ Ballast Exemption:			9421.66										
UNDER DECK TONNAGE AS MEASURED:			94.22	GROSS TONNAGE: 95.22									
UNDER TONNAGE DECK BREADTHS AND PRODUCTS													
	Section No: 1		Section No: 2		Section No: 3		Section No: 4		Section No: 5		Section No: 6		
	Depth:	0.00	Depth:	0.00	Depth:	0.00	Depth:	10.53	Depth:	10.61	9.00	10.28	
	Interval:	0.00	Interval:	0.00	Interval:	0.00	Interval:	2.63	Interval:	2.65	Interval:	2.57	
Simpson's Multiplier	Breadth	Product	Breadth	Product	Breadth	Product	Breadth	Product	Breadth	Product	Breadth	Product	
1	0.00	0.00	0.00	0.00	0.00	0.00	24.33	24.33	24.33	24.33	24.33	24.33	
4	0.00	0.00	0.00	0.00	0.00	0.00	16.55	66.20	16.57	66.27	16.78	67.13	
2	0.00	0.00	0.00	0.00	0.00	0.00	15.05	30.10	15.22	30.43	15.35	30.70	
4	0.00	0.00	0.00	0.00	0.00	0.00	14.13	56.53	14.57	58.27	14.77	59.07	
1	0.00	0.00	0.00	0.00	0.00	0.00	2.38	2.38	2.98	2.98	5.13	5.13	
Total:		0.00		0.00		0.00		179.55		182.28		186.37	
1/3 interval:		0.00		0.00		0.00		0.88		0.88		0.86	
Area in square feet:		0.00		0.00		0.00		157.48		161.14		159.71	
	Section No: 7		Section No: 8		Section No: 9		Section No: 10		Section No: 11				
	Depth:	10.13	Depth:	9.69	Depth:	0.00							
	Interval:	2.53	Interval:	2.42	Interval:	0.00							
Simpson's Multiplier	Breadth	Product	Breadth	Product	Breadth	Product							
1	25.67	25.67	25.67	25.67	0.00	0.00							
4	18.22	72.87	18.45	73.80	0.00	0.00							
2	16.73	33.47	16.78	33.57	0.00	0.00							
4	16.18	64.73	16.25	65.00	0.00	0.00							
1	6.13	6.13	8.03	8.03	0.00	0.00							
Total:		202.87		206.07		0.00							
1/3 interval:		0.84		0.81		0.00							
Area in square feet:		171.17		166.43		0.00							

